# EST3

## Features

- **168 character LCD**
  - displays information important to user first
  - First and Last alarm display hands free
- **Exceptional alarm response times**
  - 3 second alarm response time over any size network
  - 750ms loop alarm response time
- **Total network wiring over 300,000 feet**
- **Eight multiplexed channels for audio source selection on one pair of wires**
- **Zoned audio amplifiers**
- **Supports proprietary and local system operations**
- **For retrofit existing wire may be used if electrically sound**
- **Slide in LED and switch labels**
- **Signature series detectors and modules support**
- **Automatic device and panel addressing**
- **250 devices per loop, 2500 devices per node**
- **Device circuit mapping**
- **Up to 32 trouble bits per device for trouble shooting**

## Description

EST3 is a modular system uniquely designed to easily meet the needs of standalone single node systems or multi-node networks. Both fire alarm and audio systems use the same fundamental components simplifying system layouts. A powerful System Definition Utility helps define flexible system operations in a fraction of the time required by others. Virtually all EST3 operating features are software controlled. This gives EST3 great site flexibility and ensures operational changes and upgrades will be possible years after the initial installation.

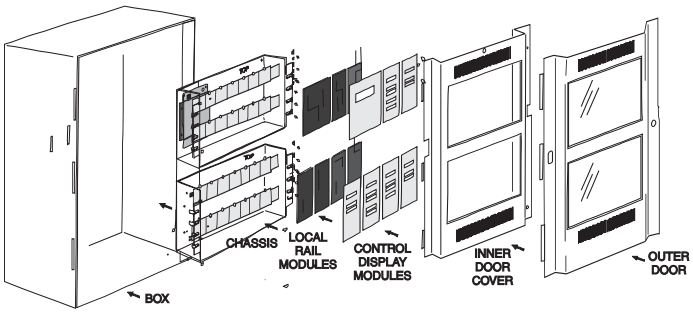
From the elegant contoured door design of the Lobby Enclosure through the standard industrial design of Remote Closet cabinets both aesthetics and function are addressed.

## Application Notes

EST3 is a superbly adaptable Life Safety System lending itself to smaller and larger buildings alike. System components arrange in layers starting with the wallbox system and ending with inner and outer doors. Cabinets are available with room for system batteries up to 65 Amp hours. With EST3 one 24 volt battery supports up to four power supplies.

The power supplies use a unique paralleling arrangement that ensures optimization of each supplies full capacity. Each supply will support up to 7 Amps of load, with four supplies 28 Amps of current is available all backed up by one battery. This gives EST3 continuing cost saving benefits in system maintenance as well as initial system cost.

A user interface layer made up of a Main Display Interface module and a system of generic modules maximize design flexibility for custom systems.



**Main Display Interface**
EST3's Main Display Interface module focuses on the emergency user. Simple to understand lights and switches help the operator execute system commands with confidence. Eight lines of 21 characters (168 characters total) provide the room needed to convey emergency information in a useful format. Hands free, the first highest priority event displays. The Main Display always shows the last highest priority event. Without opening the door of the EST3 the first and last alarm is given. EST3 modular system design means a Main Display Interface module is not required in remote nodes with no user interface requirements.

EST3's Main Display Interface provides a menu system to support maintenance functions such as point disabling or reports for use by staff or service personnel.

**Display Modules**
EST3's, generic control/display module's provide membrane switches with positive tactile feedback and colored LEDs giving the emergency user the simplest of interfaces. Control/Display module locations are independent of the underlying connection hardware, the local rail module. This keeps system lay out flexibility maximized.

**Panel Capacities**
EST3 makes isolation of field wiring easy with building wiring termination's being made on local rail module removable terminal blocks. EST3 local rail modules include, zoned amplifiers, Single Signature Loop Controllers, Conventional Hardwired modules, and the main CPU module. System design allows convenient separation of high voltage and power limited wiring.

EST3 supports both single node and multiple node single network systems. As a stand alone panel or single node from 5 to 21 module spaces are available. This provides enough space for up to four system power supplies providing 28 Amps of power. A single panel supports up to 10 Signature loop controllers (250 devices per loop, 2500 points total per node). Utilizing conventional circuits, up to 15 local rail modules fit, supporting 120 conventional zones. Up to half of the conventional circuits could be Notification Appliance Circuits, with 19 Control Display modules, and a Main Display Interface module.

**Networks**
EST3 operates on a multi priority peer-to-peer token ring network. The multi-priority token ring gives EST3 exceptional alarm response. Response time is less than 3 seconds across the network virtually independent of the total number of nodes. EST3 token ring network configuration also affords long distances between nodes. The distance between panels on #18AWG (1.0mm$^2$) is 5000ft (1523m). With 64 nodes supported on a network the total network length is in excess of 300,000 ft (91400m).

Network communication is via RS-485 serial ports. This two wire circuit supports Class 'A' or 'B'. The EST3 network meets NFPA style 7 communications standards in Class 'A' configuration.

The EST3 uses distributed data base technology, designed to survive the rigors of fire and fire fighting. In Class 'B' configuration a single break or short on the network wiring will isolate the system into two groups of panels each with one or more nodes. Each group of panels continues functioning as a peer-to-peer network working with their combined data bases. In Class 'A' a single break or short on the network wiring causes the system to isolate the fault. Network communication continues uninterrupted. If multiple faults occur, the network re-configures into multiple networks and functions as described above for Class 'B'. This means a system continues to respond to activations from every node that can transmit and receive network messages. Local responses always execute since the local data base resides at each node maximizing survivability.

**Adding Audio**
EST3 audio is a matter of selecting components for installation in standard fire alarm cabinet assemblies. EST3 uses intelligent zoned amplifiers, this reduces wire runs and space needs at a central location. Audio control equipment and zoned amplifiers use the same system power supplies as fire alarm components. All these components are supported by standby battery. Where multiple nodes make up the system a single pair of wires carries eight channels of digital audio between nodes. The system will deliver up to eight messages/signals simultaneously meaning occupants signaling messaging is never interrupted. This eliminates confusion when the emergency user requires the use of an audio channel when delivering zone specific messages.

The EST3 provides simple paging controls. Pressing the ALL CALL selects all paging zones for message delivery. Pressing Page to EVACUATION automatically selects all areas in evacuation. Similarly, the user can Page to ALERT. Zoned paging requires the user to simply press zone paging switches. After the user completes a page delivery, signaling automatically restore when the user releases the microphone talk key.

## Engineering Specification

It shall be possible to support a single stand alone node or up to 64 nodes communicating on a peer-to-peer multi-priority token ring protocol network. Any node on the network with a new alarm must have priority on the Network. Network alarm response must be under 3 seconds. Field wiring connections must be made at removable terminal blocks. Status LEDs shall be provided for communications of network, RS-232, audio and internal rail communications. Internal node communication speed must be programmable. The control panel and system components must be manufactured by an ISO 9001 standards listed company.

The communication format between the control panel and analog devices shall be digital.

Loop alarm recognition must be within 750 milliseconds of a device reporting an alarm state. It must be possible to wire the Loop as Class A or Class B with non shielded, non twisted wire. It must be possible to wire branches (T-taps) with Class B wiring. Should the communications between devices and the Data controller be lost, the device circuit shall go into stand-alone mode. The circuit shall act like a conventional alarm receiving circuit in the stand alone mode. Should bus communications be lost, local rail modules must continue to function, recognize and store functional status changes. In the event of an alarm, provision must be made to signal the network and make it aware of the alarm condition.

The fire alarm power supplies must be capable of being paralleled and share the load. Multiple power supplies must be capable of being backed up with a single 24 volt battery pack for reduced maintenance. A battery per power supply is not acceptable. The power supply shall be capable of charging up to 65 AH batteries. The power supply must be able to perform an automatic load test of batteries and return a trouble if the batteries fall outside a predetermined range. Power supplies must incorporate the ability to adjust the charge rate of batteries based on ambient temperatures. It shall be possible to adjust for ambient temperature changes in local cabinets as well as remote cabinets.

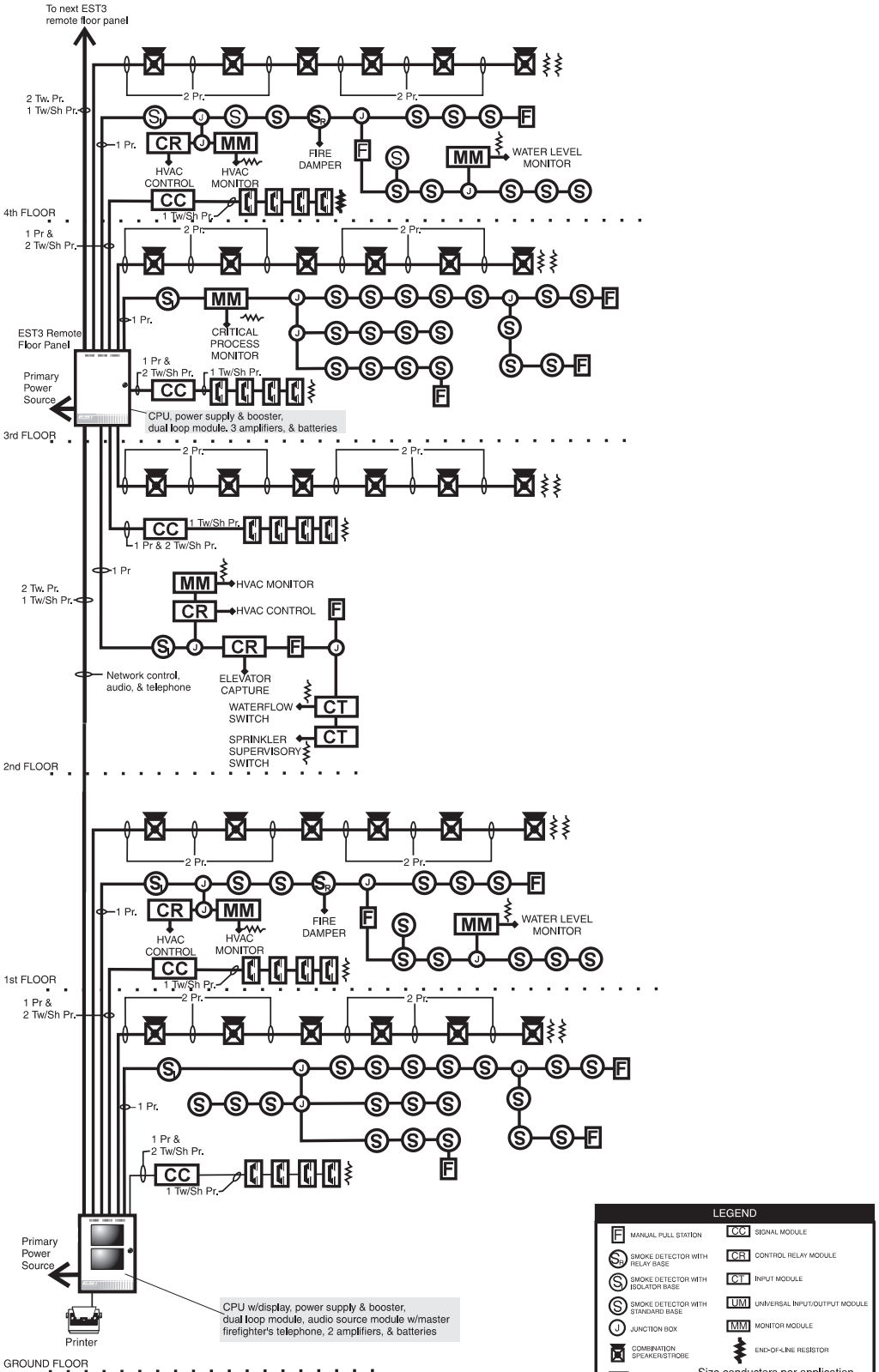
The system shall provide a user interface that displays system events in a text format, and supports basic common control LEDs and switches. The Common Control Switches and LEDs provided as minimum will be; Reset switch and LED, Alarm Silence switch and LED, Panel Silence switch and LED, Drill switch and LED. It must be possible to add additional common controls as required through the use of modular display units. The user interface must provide an LCD that will allow custom event messages of up to 42 characters. The system must provide the emergency user, hands free viewing of the first and last highest priority event. The last highest priority event must always display and update automatically. Events shall be automatically placed in easy to access queues. It shall be possible to view specific event types separately. Having to scroll through a mixed list of event types is not acceptable. The total number of active events by type must be displayed. Visual indication must be provided for any event type that has not been acknowledged or viewed. It must be possible to customize the designation of all user interface LEDs and Switches for local language requirements.

The Life Safety system shall incorporate annunciation of Alarm, Supervisory, Trouble and Monitor operations. Annunciation must be through the use of LED display strips complete with a means to custom label each LED as to its function. Where applicable control of remote smoke control devices must be made available at the control center. Switches with LEDs must provide positive feed back to the operator of remote equipment status. Where voice audio is required a means of paging individual zones must be made. The status of each paging zone must be annunciated. It must be possible to selectively page into specific zones. It shall be possible to manipulate the evacuation of the building from the main control center. It must be possible for the emergency operator to put specific zones into evacuation manually.

The audio system amplifiers must be able to operate 25Vrms or 70.4Vrms speakers. The system shall provide simultaneous page, alert and evacuation signaling. Systems that cause signaling devices to go silent while performing any signaling functions will not be accepted. System amplifiers must be distributed zoned type. Centrally banked systems are not acceptable. An integral circuit for operating traditional NAC devices must be provided with each system amplifier. The circuit must have a minimum rating of 3.5 Amps for operating 24Vdc signals. It must be possible to have up to 8 separate audio signal sources for paging and signaling purposes. The system must provide as a minimum the following paging common controls and indicators: Ready to page LED, VU display of paging output level, single switch function for paging to all - Alert zones, Evacuation zones, and areas not programmed for signaling. The system must provide high quality analog to digital conversion of paging sources. Digital transmission of paging must be provided between system nodes. The analog sources must be sampled and converted to digital with a sampling rate no less than 9600 baud. It must be possible to transmit signal sources (Alert, Alarm, Page, etc.) together over a single pair of wires between nodes.

The fire panel shall be capable of supporting a variety of conventional smoke detectors with a single module. It must be possible to support polarized bells, horns or strobes. It shall be possible to provide hardwired supervisory and monitor functions with latching or non-latching operations. It shall be possible to display any circuit on an LCD or LED annunciator located anywhere on the network.

# Typical Wiring




Typical EST3 Wiring with
Emergency Voice/Alarm System w/ Firefighter's Telephones

**EDWARDS SYSTEMS TECHNOLOGY**

It is our intention to keep the product information current and accurate. We can not cover specific applications or anticipate all requirements. All specifications are subject to change without notice. For more information or questions relative to this Specification Sheet, contact EST.



Literature Sheet #85010-0051
Printed in U.S.A.
Issue 1